1. Gated transport involves:
2. The transport of marcomolecules from the cytosol to the ER lumen or mitochondria
3. The transport of macromolecules from the cytosol to the nucleus through nuclear pores
4. The transport of soluble proteins from the ER to the golgi to the cell exterior
5. The transport of proteins from the cell exterior through the cytosol into the nucleus
6. Which face of the golgi apparatus is the furthest from the Rough ER?
7. Medial face
8. Planar face
9. Cis face
10. Trans face
11. Which technique would be best in order to determine the biochemical composition of a cell?
12. Differential centrifugation
13. Light Microscopy
14. Cell culture
15. Electron microscopy
16. Which drug would be most likely used in order to stabilize tubulin in a cancer patient?
17. Colcemid
18. Phalloidin
19. Cytochalasin D
20. Taxol
21. Which is incorrect about intermediate filaments?
22. They provide cell structure and support
23. They crosslink with the plasma membrane, nuclear membrane, microtubules, and microfilaments
24. They are polar
25. None of the above
26. How do molecules larger than 60 kDa most specifically leave the nucleus?
27. They are transported by exportins
28. They bind to lamins and are excreted out
29. Through nucleoporins
30. They are transported out by importins
31. Which microtubules allow for the most direct chromosome separation during mitosis?
32. Astral microtubules
33. Kinetochore microtubules
34. Centrosomal microtubules
35. Polar microtubules
36. Where is actin most likely to be found?
37. Microvilli
38. Spindle pole
39. Cell nucleus centrosome
40. Cilia or flagella
41. Which Immunoglobulin would respond during an allergic reaction?
42. IgE
43. IgG
44. IgD
45. IgA
46. IgM
47. What is the cause of Hereditary Spherocytosis?
48. Improper megakaryocyte fragmentation
49. T-Helper cell destruction
50. Spectrin Malfunction
51. Red blood cells become too flexible
52. Which is the correct order of cell development, starting from first to last?
53. PHSCs, MHSCs, Progenitor cells, Precursor cells
54. Precursor cells, Progenitro cells, MHSCs, PHSCs
55. MHSCs, PHSCs, Precursor cells, Progenitor cells
56. Progenitor cells, Precursor cells, PHSCs, MHSCs
57. Which cells would be amplified in order to initiate the inflammatory process?
58. Eosinophils
59. T-Cells
60. Monocytes
61. Basophils
62. What is the composition of serum?
63. 93% water and 7% dissolved substances
64. Plasma without fibrinogen or clotting factors
65. Only water and clotting factors
66. Water, fibrinogen, albumins, electrolytes, and nutrients
67. Which is incorrect?
68. Hemoglobin- Men: 14-17 g/dL, women: 12-15 g/dL
69. Hematocrit- Men: 45-60% RBCs, women: 35-45% RBCs
70. The average person has 2.5 L of RBCs and 3 L of plasma
71. RBCs have a life span of 120 days while platelets have a life span of 10 days
72. Which is the most common amphipathic membrane lipid?
73. Phospholipid
74. Triglyceride
75. Glycolipid
76. Cholesterol
77. ~~Which relies on a concentration gradient to pass through the lipid bilayer?~~
78. ~~Gases~~
79. ~~Ions~~
80. ~~Water~~
81. ~~Small, uncharged molecules~~
82. Which membrane would be the most fluid?
83. A membrane with saturated, orderly F.A tails that is cis and has cholesterol added below Tm
84. A membrane with unsaturated, kinked F.A tails that is cis and has cholesterol added below Tm
85. A membrane with unsaturated, kinked F.A tails that has cholesterol added above Tm
86. A membrane with saturated, orderly F.A tails that has cholesterol added above Tm
87. You are a physician and a patient comes to you presenting with hypoxia, fatigue, pallor, and jaundice. You notice that all of these conditions could be attributed to lack of adequate oxygen circulation in the body, and after deliberation, decide that the patient has Hereditary Spherocytosis, which is caused by:
88. Overproduction of RBCs
89. Increased interaction between peripheral and integral membrane proteins
90. Mutations in the Spectrin/ankyrin genes
91. Increased exoplasmic RBC phosphatidylserine exposure leading to macrophage recognition and apoptotic cell destruction.
92. Which is an incorrect example of membrane asymmetry?
93. More choline on the cytoplasmic side
94. More unsaturated F.A acyl chains on the RBC cytoplasmic side
95. More aminophospholipids on the cytoplasmic side
96. More phosphatidylserine on the exoplasmic side in pathological cells
97. Which is incorrect?
98. The rate of facilitated diffusion is much higher than simple diffusion
99. Facilitated diffusion is transport specific while simple diffusion is not
100. Neither facilitated nor simple diffusion are active
101. Facilitated diffusion relies on limitless carrier proteins
102. How is glucose taken in via facilitated diffusion?
103. Insulin causes more GLUT 4 receptors on the cell surface to take more glucose into the cell
104. Insulin received by insulin receptors signals for the breakdown of glycogen and glucose is then released from the cells
105. When insulin is received by insulin receptors, signal transduction allows GLUT 4 containing vesicles to fuse with the cell surface so that glucose can come in through these channels
106. None of the above
107. In order to treat a patient with heart failure, you prescribe Digitalis, a drug known to contain Ouabain. How does this drug work in order to increase cardiac contraction strength?
108. It blocks the Na+/Ca++ ATPase so that increased Ca++ can be released from the RER and then be used for contraction
109. It slows the Na+/K+ ATPase so that increased Na+ within the cell can be exchanged for Ca++, which is then used for contraction
110. It increases Na+/K+ ATPase activity so that increased K+ can be exchanged for Ca++ which can then be used for contraction
111. It increases Na+/Ca++ ATPase activity so that increased Ca++ can be used for contraction
112. You are a physician and a patient presents with muscle weakness, especially upon exertion. You diagnose Myasthenia Gravis and account that the patients:
113. Nicotinic acetylcholine receptors are being attacked by autoantibodies
114. CFTR receptor is malfunctioning and unable to pump out Cl-
115. Acetylcholine is not being produced adequately at the neuromuscular junction
116. An ABC-Type receptor malfunction in the cause
117. Which chemical bond does not rely on electrostatic interactions?
118. Covalent Bond
119. Van der Waals bond
120. Hydrogen bond
121. Ionic bond
122. What is the hydrophobic effect?
123. When water surrounds and dissolves other molecules, yielding increased entropy
124. When water forms H-bonds with polar substances, yielding decreased entropy
125. When water forms H-bonds with non-polar substances, yielding decreased entropy
126. When non-polar aggregates disrupt water molecules, yielding increased entropy
127. Which is true about a zwitterions?
128. At neutral pH, it is negatively charged
129. The isoelectric point is when it moves the fastest in electric fields
130. It is charged but neutral
131. At high pH, it is positively charged
132. Which is the best buffer?
133. A strong acid and its weak conjugate base
134. A weak acid and its strong conjugate base
135. An acid and base which completely ionize in water
136. A strong base and its weak conjugate acid
137. Which amino acid has a nonpolar, aliphatic R group?
138. Tyrosine
139. Glycine
140. Arginine
141. Serine
142. Which amino acid is acidic?
143. Q
144. Arg
145. C
146. Trp
147. Which is a measure of rotation between the N and the α-Carbon in a peptide?
148. Pie
149. Phi
150. ψ
151. Psi
152. How many amino acids are in a protein with molecular weight 20,000 D?
153. 200
154. 60
155. 2000
156. 180
157. Which has each amino acid on one strand H-bonded to two amino acids on the opposite strand?
158. Anti parallel beta pleated sheet
159. B alpha helix
160. Parallel Beta pleated sheet
161. Z alpha helix
162. Which is incorrect?
163. A polypeptide chain is covalently linked by amide bonds
164. Trans peptide bonds are more frequent because cis cause steric hindrance
165. Reverse turns give compact globular shapes to many proteins
166. The main features of a polypeptide chain are the R-groups and the dihedral angles
167. Which is incorrect about proteins?
168. Primary structure is amino acid sequence
169. Secondary structure is alpha helix or beta sheet
170. Tertiary structure is one complete folded protein chain and reverse loops
171. Quaternary structure is 2 or more chains (dimmers, temtamers)
172. How is collagen stabilized via post-translational modification?
173. Phosphate addition
174. Hydroxyl addition
175. Choline addition
176. Acetyl addition
177. Why is affinity chromatography better for protein purification than other methods?
178. Because it separates molecules by size rather than shape
179. Because it purifies and yields protein specific activity
180. Because it separates molecules by charge
181. It increases protein yield dramatically
182. What is Edman Degradation used for?
183. To find protein amino acid composition
184. To find the specific activity of a protein
185. To find amino acid sequence
186. To find protein function
187. After denaturing a protein with Beta Mercaptoethanol and urea, how is a scrambled, inactive renatured protein obtained?
188. By removing beta mercaptoethanol
189. By removing urea in the presence of excess oxygen
190. By removing both beta mercaptoethanol and urea in the presence of excess oxygen
191. By removing urea
192. Which of the following does the mesoderm give rise to?
193. Mesothelium
194. Endothelium
195. Epithelium
196. All of the abve
197. All except C
198. All of the following help to form microvilli except:
199. Talin
200. Fimbrin
201. Villin
202. Actin
203. Spectrin
204. Which is associated with a full bladder?
205. Distended uroepithelium
206. Transitional epithelium
207. Squamous surface cells
208. 4 layers of cells
209. All of the above
210. Which are most superficial to the apical surface?
211. Adhesion Belt
212. Zonula Occludens
213. Desmosomes
214. Zonula Adherens
215. Macula Adherens
216. Which mode of secretion is exhibited by a sebaceous skin gland?
217. Merocrine
218. Apocrine
219. Cytocrine
220. Holocrine
221. Eccrine
222. Kartagener’s Syndrom is caused by:
223. Immotile microvilli
224. Antibodies to cadherin desmoglein
225. Lack of dyenin cross arms
226. Lack of Nexin protein
227. Which fixed cell has a vesicular nucleus with nucleolus?
228. Fibrocyte
229. Plasma cell
230. White adipocyte
231. Macrophage
232. Brown adipocyte
233. Which type of collagen resists pressure?
234. I
235. II
236. III
237. IV
238. V
239. How does lack of Vitamin C cause Scurvy?
240. Lysine doesn’t get hydroxylated since vitamin C is a necessary cofactor therefore procollagen isn’t formed properly
241. Procollagen peptidase can’t cleave procollagen properly because vitamin C is a necessary cofactor for the reaction
242. Proline doesn’t get hydroxylated since vitamin C is a necessary cofactor therefore procollagen isn’t formed properly
243. All of the above
244. A and C
245. Which glycoproteins are located in the basement membrane?
246. Laminin and Osteonectin
247. Fibronectin and Nexin
248. Entactin and Tenascin
249. Entactin and Talin
250. Tenascin and Chondronectin
251. Which would be a cause of myxedema?
252. Hypothyroidism
253. Hypertension
254. Liver disease
255. Starvation
256. Anaphylactic shock

Answers:

1. B (point- Cell divided into 2 regions- nucleus & cytoplasm: Page 22 of Notes, Unit 1)
2. D (page 17)
3. A (page 13)
4. D (page 105)
5. C ( page 94)
6. A (page 113)
7. B (page 383-384)
8. A (page 87)
9. A (page 150)
10. C (page 134)
11. A (page 143)
12. D (page 138)
13. B ( page 127)
14. B ( page 131)
15. D (page 175)
16. C
17. B (page 173)
18. C (page 134)
19. A (page 179)
20. D (page 230)
21. C (page 232)
22. B (page 246)
23. A (page 241)
24. A (page 31-32)
25. D (page 38)
26. C (page 49)
27. B (page 41)
28. B (page 51)
29. A (page 54)
30. B (page 60)
31. D (page 64; average weight of AA ~110)
32. C (page 67)
33. D (page 56 - 81)
34. C (page 56- 81)
35. B (page 211)
36. D (page 217)
37. C (page 222)
38. A (page 206)
39. E (page 187)
40. A (page 191)
41. E (page 189)
42. B (190 – 193)
43. D (page 200)
44. C (page 193)
45. A (page 258)
46. B (page 269ish)
47. D (page 211 &265)
48. C (page 269)
49. A (page 270)